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ABSTRACT

This document offers a snapshot of enrollment and graduation statistics of African Americans, Latinos, and American Indians in engineering institutions in the United States. This data provides the baseline for a series that will examine institutional productivity over time and will include analyses of retention and effective university policy in addition to ongoing access. Highlights in this report include the following: (1) minority enrollment in engineering has declined 8.2 percent from its peak of 15,181 in 1992-93 to 13,929 in 1997-98; (2) in the African American community, the enrollment decline has dropped 17 percent during the past 5 years and minority engineering enrollment at historically Black colleges declined 40.2 percent since 1992; (3) 50 percent of all African American, Latino, and American Indian freshmen enrolled at just 39 institutions, 11 percent of the engineering schools; (4) 50 percent of all Bachelor of Science of Engineering degrees came from 10 percent, or 34, of the engineering schools; and (5) at 42 of the nation's engineering institutions, not a single minority student was enrolled in 1997-98, and at 46 institutions, not a single minority engineer graduated in 1996-97. (CCM)

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Keeping Score
Comparative Performance of Engineering Institutions in Creating Access, 1997-98

By
Ronni Denes
Robert J. Highsmith

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NACME October 1998 Volume 8, Number 2

Research Letter

Highlights

- Minority enrollment in engineering has declined 8.2 percent from its peak of 15,181 in 1992-93, to 13,929 in 1997-98, foreshadowing imminent declines in graduation.
- In the African American community, the enrollment decline has been precipitous, dropping a staggering 17 percent during the past five years. A decrease of this magnitude necessarily has taken a heavy toll on the Historically Black Colleges and Universities – traditionally providers of greatest access – where minority engineering enrollment declined 40.2 percent since 1992.
- Minority enrollment in the nation's engineering schools remains highly skewed, with 50 percent of all African American, Latino and American Indian freshmen enrolled at just 39 institutions, 11 percent of the engineering schools.
- Achievement in graduating minority engineers remains concentrated in a small set of institutions as well, with 50 percent of all BSEs conferred on minority students coming from 10 percent, or 34 engineering schools.
- Although minority students comprise only 15.7 percent of the entering freshman class in engineering, at the 50 institutions with the greatest enrollment of minority freshmen, the average share of class jumps to 26 percent.
- Of the 25 engineering institutions that are top ranked by *U.S. News and World Report*, only 5 exceeded the national average of 15.7 percent minority freshmen and only 7 exceeded the national average of 10 percent minority graduates.
- At 42 of the nation's engineering institutions, 81.0 percent of them accredited by the Accreditation Board for Engineering and Technology (ABET), not a single minority student was enrolled in 1997-98; at 46 institutions, 76.1 percent accredited by ABET, not a single minority engineer graduated in 1996-97.

Keeping Score

Comparative Performance of Engineering Institutions in Creating Access, 1997-98

by Ronni Denes and Robert J. Highsmith

Introduction

In June 1998, NACME and the National Academy of Engineering convened the Summit on the 21st Century Work Force. Structured as a highly interactive set of problem-solving workshops, this national leadership forum brought together 140 public and private-sector decision makers to create a new action agenda for increasing diversity in engineering.

Charged with reassessing the strategies that create access and promote excellence, Summit participants addressed critical challenges in the current environment: a decade-long decline in the number of engineering graduates, growing dependence on imported talent, a significant drop in minority enrollment, persistently low retention rates, large disparities in k-12 educational opportunities and the nationwide assault on affirmative action.

Although individual working groups focused on the specific and unique problems of precollege access, university retention or workplace mobility, they nonetheless produced several outcomes that cut across all levels of inquiry and all sections of the pipeline. Chief among these was the call for accountability, for a cataloguing of the commitment and impact of employers, policy-makers, educators and advocates. In particular, NACME was called upon to inventory and compare the performance of colleges and universities – key institutions in the production pipeline – and to use the resulting data to establish benchmarks, publicize extraordinary achievement, and call attention to serious negligence.

This NACME Research Letter, *then, which offers a snapshot of enrollment and graduation of African Americans, Latinos and American Indians in the nation's engineering institutions, becomes the baseline for a series that will examine institutional productivity over time and will include analyses of retention and effective university policy in addition to ongoing access. After all, to paraphrase the legendary coach Vince Lombardi, if you aren't keeping score, you aren't really playing the game.*

Enrollment and Graduation

Freshman enrollment, the gateway through which minorities enter the engineering profession, is considerably smaller today than it was five years ago. From a peak enrollment of 15,181 African American, Latino and American Indian freshmen in 1992-93, minority freshman enrollment declined 8.2 percent, dropping to 13,929 in 1997-98. As a share of the class, minority students lost ground also, falling from 16.4 percent of all freshmen who enrolled in 1992-93 to 15.7 percent in 1997-98.

As an advance indicator of graduation rates, enrollment declines foreshadow declines from the record number of minority engineering graduates in 1996-97, when underrepresented minorities constituted one of every ten new engineers. The eventual

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Tables

The tables in this report rank engineering institutions by their performance in enrolling minority students and graduating minority engineers. The information arrayed in the tables was provided by colleges and universities reporting to the Engineering Workforce Commission[1], which collects data on minorities and women under a grant from NACME. Two appendices list institutions alphabetically to permit easy identification of their relative rankings.

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impact of these declines on the number of graduates will be attenuated, in part, by the fact that the graduation rate for minorities who enroll in engineering is 35 percent.[2] That notwithstanding, next year the number of new minority engineers can be expected to *decline* for the first time in a decade (see Figure 1),[3] reflecting the sizeable falloff in enrollment that began in 1993-94. Although ten percent remains far short of the share of graduates one would expect from a minority population that constitutes 29.7 percent of all college-aged students, the record graduating class of 6,422 that yielded this year's ten percent level will not be repeated given the erosion of minority enrollment in engineering.

Compounding and contributing to the decline in minority freshman enrollment is the fact that the set of institutions participating in developing the minority talent pool remains extremely small. Only a fraction of all engineering institutions has demonstrated achievement in enrolling minority engineering students and graduating minority engineers; the majority of the nation's engi-

Table I

50 Institutions Enrolling the Greatest Number of Minority Freshmen in Engineering, 1997-98

Institution	Rank	Total Minority (N)	Total (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)
Southern University+	1	336	343	98.0	329	0	7
U Texas – El Paso++	2	333	472	70.6	7	326	0
Michigan State University	3	271	1323	20.5	230	32	9
City College of New York	4	269	455	59.1	109	160	0
Tennessee State University+	5	266	279	95.3	266	0	0
North Carolina A&T State University+	6	264	288	91.7	264	0	0
Texas A&M University	7	232	1734	13.4	54	170	8
Florida A&M University/Florida State University+	8	229	458	50.0	209	19	1
Morgan State University+	9	222	236	94.1	222	0	0
North Carolina State University – Raleigh	10	199	1273	15.6	160	29	10
U Michigan – Ann Arbor	11	192	944	20.3	120	67	5
U Oklahoma	12	189	596	31.7	101	48	40
Cal Poly-San Luis Obispo	13	183	1088	16.8	22	144	17
U Texas – Austin	14	181	1048	17.3	26	150	5
California State University – Northridge	15	180	416	43.3	53	125	2
Cal Poly – Pomona	16	173	647	26.7	22	149	2
New Mexico State University	17	170	352	48.3	4	152	14
U Florida	18	169	896	18.9	71	94	4
U Texas – Pan American++	19	168	211	79.6	0	167	1
Georgia Institute of Technology	20	157	1506	10.4	122	34	1
Tuskegee University+	21	152	154	98.7	151	1	0
California State University – Long Beach	22	148	377	39.3	47	100	1
Polytechnic University	23	143	607	23.6	67	70	6
U Illinois – Urbana Champaign	24	142	1226	11.6	67	71	4
Howard University+	25	141	181	77.9	141	0	0
U Maryland – College Park	26	140	670	20.9	104	35	1
Florida International University++	27	139	211	65.9	24	115	0
Ohio State University	28	134	1247	10.7	115	15	4
Mississippi State University	29	132	550	24.0	126	2	4
Prairie View A&M University+	30	130	136	95.6	130	0	0
U Southern California	31	128	559	22.9	28	91	9
California State University – Los Angeles++	31	128	174	73.6	9	118	1
U New Mexico++	33	127	296	42.9	12	92	23
Rutgers University	33	127	639	19.9	71	55	1
New Jersey Institute of Technology	35	126	471	26.8	64	61	1
U Arizona	36	122	561	21.7	11	94	17
U Alabama	37	120	536	22.4	117	2	1
Texas A&M University – Kingsville++	38	119	165	72.1	8	108	3
Louisiana State University	39	118	805	14.7	95	20	3
U Texas – San Antonio++	40	116	193	60.1	8	108	0
Arizona State University	40	116	493	23.5	16	70	30
Pennsylvania State University	42	112	2334	4.8	62	48	2
U South Carolina	43	111	362	30.7	102	9	0
U Miami	44	108	250	43.2	47	59	2
U Illinois – Chicago	45	107	414	25.8	33	72	2
Auburn University	46	105	993	10.6	91	6	8
U California – San Diego	47	100	651	15.4	19	76	5
San Jose State University	48	97	543	17.9	40	55	2
U New Orleans	49	92	261	35.2	57	20	15
California State University – Sacramento	50	89	342	26.0	33	50	6
Totals		**8,052**	**30,966**		**4,286**	**3,489**	**277**
Averages		**161**	**619**	**26.0**	**86**	**70**	**6**

+HBCUs
++HACUs

Figure 1
Minority Engineering Graduates
Projected Decline, National

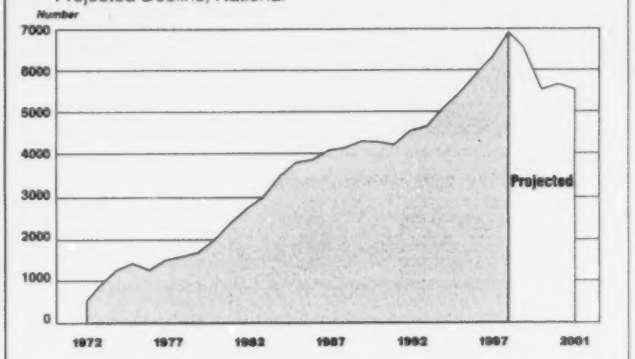
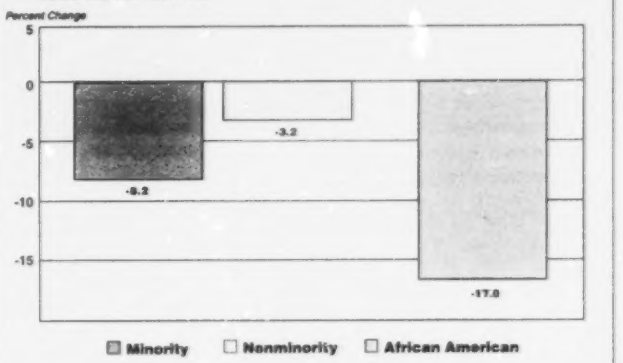


Figure 2
Decline in Freshman Engineering Enrollment
1992-93 vs. 1997-98



neering schools is paying far less attention to the imperative of demographics or the benefits of diversity. Fifty percent of all minority engineering freshmen enroll in just 39 colleges and universities, 11 percent of all institutions. Fifty percent of all minority graduates receive their BSE degrees from 34 institutions, only 10 percent of all engineering institutions. It is noteworthy that 42 institutions – 81 percent of them accredited by the Accreditation Board for Engineering and Technology (ABET) – did not enroll any minority freshman engineering students in 1997-98; 46 colleges and universities, about half of them the same institutions – 76.1 percent of them accredited by ABET – did not graduate a single minority engineer in 1996-97.

The prospects facing African Americans are particularly disturbing. Enrollment of African American freshmen in engineering has declined precipitously, dropping a staggering 17 percent from the high of 8,924 students in 1992-93, a decrease of more than 1,500 entering freshmen. Among all minority population groups, African Americans also sustained the only losses from 1996-97 to 1997-98, declining 1.1 percent, from 7,482 to 7,403 students.

50 Institutions Enrolling the Greatest Number of Minority Freshmen in Engineering, 1997-98 (see Table I)

Although nationwide, minority freshmen comprise 15.7 percent of the incoming engineering class, they are 26 percent of the entering engineering class, on average, at the 50 institutions enrolling the greatest number of minority freshmen. As might be expected, among the 50 institutions, the Historically Black Colleges and Universities (HBCUs) and the members of Hispanic Association of Colleges and Universities (HACUs) play especially important roles in providing minority students with access to engineering.

- Forty-seven of the top 50 institutions enroll at least 100 underrepresented minorities in the freshman class;
- Eight of the 13 Historically Black Colleges and Universities (HBCUs) with accredited engineering programs are among the top 50 institutions enrolling minority freshmen in engineering.

HBCUs Among Top 50, Enrollment

Institution	Number	Rank
Southern University	336	1
Tennessee State University	266	5
North Carolina A&T State University	264	6
Florida A&M/Florida State University	229	8
Morgan State University	222	9
Tuskegee University	152	21
Howard University	141	25
Prairie View A&M University	130	30

- Seven of the ten members of the Hispanic Association of Colleges and Universities (HACUs) with accredited engineering programs are among the top 50 institutions enrolling minority freshmen in engineering.

HACUs Among Top 50, Enrollment

Institution	Number	Rank
University of Texas, El Paso	333	2
University of Texas, Pan American	168	19
Florida International University	139	27
California State University at Los Angeles	128	31
University of New Mexico	127	33
Texas A&M University, Kingsville	119	38
University of Texas, San Antonio	116	40

- Even among the top 50 institutions, 9 enrolled fewer than the national average of 15.7 percent minority students in the freshman class, and one institution in the 50, Penn State University, enrolled fewer than 5 percent.

Change in Enrollment of Minority Freshmen in Engineering, 1992-1997 (see Table II)

Enrollment of minority freshmen in engineering dropped substantially (8.2 percent) from the peak year of 1992-93, due to decreases in African American enrollment totaling 17.0 percent (see Figure 2). It's important to note, however, that had this analysis been done just one year ago, Latino enrollment, which has been relatively flat during the full six-year study period, would have shown losses of 2.9 percent, which continue to impact distribution. Not surprisingly, for both African Americans and Latinos, losses were concentrated among engineering institutions enrolling the largest numbers of, and providing the greatest access to, minorities.

Table II

Change in Enrollment of Minority Freshmen in Engineering, 1992-1997

Institution	Minority Freshmen 1992-93 (N)	Minority Freshmen 1997-1998 (N)	Change 1992-93 to 1997-98 (N)	Change 1992-93 to 1997-98 (%)
Alabama A&M University+	29	17	-12	-41.4
Alfred University/SUNY: Ceramics	10	4	-6	-60.0
Arizona State University	54	116	62	114.8
Arkansas State University	0	0	0	0.0
Arkansas Tech University	4	3	-1	-25.0
Auburn University	120	105	-15	-12.5
Baylor University	8	14	6	75.0
Boston University	46	23	-23	-50.0
Bradley University	5	3	-2	-40.0
Brigham Young University	15	28	13	86.7
Brown University	27	23	-4	-14.8
Bucknell University	6	8	2	33.3
California Institute of Technology***	0	0	0	0.0
California Maritime Academy	7	3	-4	-57.1
Cal Poly - Pomona	85	173	88	103.5
Cal Poly - San Luis Obispo	192	183	-9	-4.7
California State University - Chico	36	27	-9	-25.0
California State University - Fresno	48	85	37	77.1
California State University - Fullerton	43	56	13	30.2
California State University - Long Beach	139	148	9	6.5
California State University - Los Angeles++	109	128	19	17.4
California State University - Northridge	142	180	38	26.8
California State University - Sacramento	103	89	-14	-13.6
Calvin College	0	0	0	0.0
Capitol College++		17	17	*
Carnegie Mellon University	41	44	3	7.3
Case Western Reserve University	1	3	2	200.0
Catholic University of America	5	9	4	80.0
CCNY - City College of New York	335	269	-66	-19.7
Cedarville College++		2	2	*
Central State University+	28	15	-13	-46.4
Christian Brothers University	7	18	11	157.1
Citadel	8	7	-1	-12.5
Clarkson University	21	11	-10	-47.6
Clemson University	122	88	-34	-27.9
Cleveland State University	13	17	4	30.8
Cogswell College	0	0	0	0.0
College of New Jersey**		10	10	*
College of Staten Island	14	7	-7	-50.0
Colorado School of Mines	59	75	16	27.1
Colorado State University	32	18	-14	-43.8
Colorado Technical University**		9	9	*
Columbia University	23	25	2	8.7
Cooper Union	19	11	-8	-42.1
Cornell University	52	46	-6	-11.5
Dartmouth College	12	17	5	41.7
Dordt College	0	0	0	0.0
Drexel University	77	88	11	14.3
Duke University	30	14	-16	-53.3
Embry Riddle Aeronautical University	15	67	52	346.7
Embry Riddle University - Prescott	7	10	3	42.9
Fairfield University	2	2	0	0.0
Fairleigh Dickinson University	9	4	-5	-55.6
Florida A&M University/Florida State University++	332	229	-103	-31.0
Ferris State University	0	0	0	0.0
Florida Atlantic University	41	64	23	56.1
Florida Institute of Technology	22	23	1	4.5
Florida International University++	43	139	96	223.3
Gannon University	0	1	1	*
Geneva College	1	6	5	500.0
George Mason University	34	50	16	47.1
George Washington University	26	26	0	0.0
Georgia Institute of Technology	194	157	-37	-19.1
GMI Engineering & Management Institute	35	50	15	42.9
Gonzaga University	8	0	-8	*
Grand Valley State University	7	18	11	157.1
Grove City College	0	0	0	0.0
Hampton University+	173	81	-92	-53.2
Harvard University***	0	0	0	0.0
Harvey Mudd College	8	5	-3	-37.5
Henry Cogswell College	0	0	0	0.0
Hofstra University	5	24	19	380.0
Howard University+	189	141	-48	-25.4
Humboldt State University	9	2	-7	-77.8
Idaho State University	3	5	2	66.7
Illinois Institute of Technology	88	35	-53	-60.2
Indiana Institute of Technology	11	10	-1	-9.1
Indiana University/Purdue University - Ft Wayne	8	5	-3	-37.5
Indiana University/Purdue University - Indianapolis	3	1	-2	-66.7
Institute of Paper Science & Technology	0	0	0	0.0
Iowa State University	59	48	-11	-18.6
John Brown University	0	0	0	0.0
Johns Hopkins University	19	23	4	21.1
Kansas State University	29	47	18	62.1
Lafayette College	5	14	9	180.0
Lamar University	52	38	-14	-26.9
Lawrence Technological University	46	26	-20	-43.5
Le Tourneau University	3	2	-1	-33.3
Lehigh University	11	13	2	18.2
Loras College	0	2	2	*
Louisiana State University	131	118	-13	-9.9
Louisiana Technical University	64	48	-16	-25.0
Loyola College	1	2	1	100.0
Loyola Marymount University	22	28	6	27.3
Maine Maritime Academy	0	0	0	0.0
Manhattan College	23	24	1	4.3
Mankato State University	2	0	-2	*
Marietta College	0	3	3	*
Marquette University	26	13	-13	-50.0
Massachusetts Institute of Technology***	0	0	0	0.0
Massachusetts Maritime Academy	4	2	-2	-50.0
McNeese State University	16	21	5	31.3
Mercer University	26	22	-4	-15.4
Merrimack College	1	0	-1	*
Messiah College	0	1	1	*
Miami University	6	12	6	100.0
Michigan State University	227	271	44	19.4
Michigan Technology University	34	33	-1	-2.9
Milwaukee School of Engineering	31	27	-4	-12.9
Mississippi State University	110	132	22	20.0
Monmouth University	1	0	-1	*
Montana State University	14	11	-3	-21.4
Montana Tech of the University of Montana	10	5	-5	-50.0
Morgan State University+	258	222	-36	-14.0
National Technical University	0	0	0	0.0
New Jersey Institute of Technology	203	126	-77	-37.9
New Mexico Highlands University++	43	22	-21	-48.8
New Mexico Institute of Mining & Technology	44	32	-12	-27.3
New Mexico State University++	233	170	-63	-27.0
New York Institute of Technology	14	36	22	157.1
Norfolk State University+	41	15	-26	-63.4
North Carolina A&T State University+	454	264	-190	-41.9
North Carolina State University - Raleigh	172	199	27	15.7
North Dakota State University	2	6	4	200.0
Northeastern State University	2	1	-1	-50.0
Northeastern University	23	35	12	52.2
Northern Arizona University	97	64	-33	-34.0

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Institution	Minority Freshmen 1982-83 (N)	Minority Freshmen 1997-1998 (N)	Change 1982-83 to 1997-98 (N)	Change 1982-83 to 1997-98 (%)
Northern Illinois University	48	59	11	22.9
Northwestern University	34	40	6	17.6
Norwich University	8	1	-7	-87.5
Oakland University	34	40	6	17.6
Ohio Northern University	4	3	-1	-25.0
Ohio State University	155	134	-21	-13.5
Ohio University	31	14	-17	-54.8
Oklahoma Christian University	3	5	2	66.7
Oklahoma State University	61	45	-16	-26.2
Old Dominion University	42	31	-11	-26.2
Oral Roberts University	0	0	0	0.0
Oregon State University	0	0	0	0.0
Pacific Lutheran University	0	0	0	0.0
Parks College – St Louis University	10	13	3	30.0
Pennsylvania State University	83	112	29	34.9
Philadelphia College of Textiles	1	0	-1	*
Polytechnic University	112	143	31	27.7
Portland State University	6	13	7	116.7
Prairie View A&M University+	474	130	-344	-72.6
Princeton University	29	0	-29	*
Purdue University – Calumet	10	19	9	90.0
Purdue University	121	81	-40	-33.1
Rensselaer Polytechnic University	109	79	-30	-27.5
Rice University	57	42	-15	-26.3
Rochester Institute of Technology	30	35	5	16.7
Rose – Hulman Institute of Technology	8	7	-1	-12.5
Rutgers University	112	127	15	13.4
Saginaw Valley State University	5	14	9	180.0
San Diego State University	71	78	7	9.9
San Francisco State University	15	10	-5	-33.3
San Jose State University	52	97	45	86.5
Santa Clara University	43	32	-11	-25.6
South Dakota School of Mines & Technology	13	14	1	7.7
South Dakota State University	4	2	-2	-50.0
Seattle Pacific University	0	2	2	*
Seattle University	6	7	1	16.7
Southern Illinois University – Carbondale	47	46	-1	-2.1
Southern Illinois University – Edwardsville	1	2	1	100.0
Southern Methodist University	49	30	-19	-38.8
Southern University+	573	336	-237	-41.4
St Ambrose University	1	0	-1	*
St Cloud State University	3	2	-1	-33.3
St Martins College	0	0	0	0.0
St Marys University++	29	29	0	0.0
Stanford University	73	51	-22	-30.1
Stevens Institute of Technology	46	45	-1	-2.2
SUNY – Binghamton Campus	0	7	7	*
SUNY – Buffalo Campus	77	85	8	10.4
SUNY – Stony Brook Campus	26	16	-10	-38.5
SUNY – College at New Paltz	4	6	2	50.0
SUNY – College of Environmental Science	6	0	-6	*
SUNY – Maritime College	7	0	-7	*
Swarthmore College	4	5	1	25.0
Syracuse University	40	24	-16	-40.0
Temple University	4	40	36	900.0
Tennessee State University+	249	266	17	6.8
Tennessee Technical University	30	21	-9	-30.0
Texas A&M University – Galveston	8	0	-8	*
Texas A&M University	362	232	-130	-35.9
Texas A&M University – Kingsville++	205	119	-86	-42.0
Texas Tech University	104	76	-28	-26.9
Trinity College	4	0	-4	*
Trinity University	1	0	-1	*
Tri-State University	3	4	1	33.3
Tufts University	3	6	3	100.0
Tulane University	24	14	-10	-41.7
Tuskegee University+	279	152	-127	-45.5
U Akron	64	31	-33	-51.6
U Akron – Polymer Science	0	0	0	0.0
U Alabama	118	120	2	1.7
U Alabama – Birmingham	35	37	2	5.7
U Alabama – Huntsville	31	42	11	35.5
U Alaska – Anchorage	4	2	-2	-50.0
U Alaska – Fairbanks	11	7	-4	-36.4
U Arizona	133	122	-11	-8.3
U Arkansas	52	53	1	1.9
U Bridgeport	2	4	2	100.0
U California – Berkeley	53	64	11	20.8
U California – Davis	80	74	-6	-7.5
U California – Irvine	33	48	15	45.5
U California – Los Angeles	78	67	-11	-14.1
U California – Riverside	9	18	9	100.0
U California – San Diego	93	100	7	7.5
U California – Santa Barbara	31	43	12	38.7
U California – Santa Cruz	17	25	8	47.1
U Central Florida	81	85	4	4.9
U Cincinnati	32	28	-4	-12.5
U Colorado – Boulder	53	60	7	13.2
U Colorado – Colorado Springs	4	16	12	300.0
U Colorado – Denver	7	8	1	14.3
U Connecticut	28	18	-10	-35.7
U Dayton	17	28	11	64.7
U Delaware	33	44	11	33.3
U Denver	3	3	0	0.0
U Detroit Mercy	9	34	25	277.8
U District of Columbia+	91	29	-62	-68.1
U Evansville	2	6	4	200.0
U Florida	0	169	169	*
U Georgia	4	3	-1	-25.0
U Hartford	9	12	3	33.3
U Hawaii	0	10	10	*
U Houston	114	86	-28	-24.6
U Idaho	11	5	-6	-54.5
U Illinois – Chicago	106	107	1	0.9
U Illinois – Urbana Champaign	172	142	-30	-17.4
U Iowa	17	14	-3	-17.6
U Kansas	20	27	7	35.0
U Kentucky	24	34	10	41.7
U Louisville	29	31	2	6.9
U Lowell	17	18	1	5.9
U Maine – Orono	3	7	4	133.3
U Maryland – Baltimore County	42	66	24	57.1
U Maryland – College Park	53	140	87	164.2
U Massachusetts – Amherst	31	24	-7	-22.6
U Massachusetts – Dartmouth	2	13	11	550.0
U Memphis	17	16	-1	-5.9
U Miami	70	108	38	54.3
U Michigan – Ann Arbor	210	192	-18	-8.6
U Michigan – Dearborn	11	18	7	63.6
U Minnesota	27	34	7	25.9
U Minnesota – Duluth	1	4	3	300.0
U Mississippi	24	37	13	54.2
U Missouri – Columbia & Kansas City	26	43	17	65.4
U Missouri – Rolla	52	24	-28	-53.8
U Nebraska – Lincoln	6	13	7	116.7
U Nevada – Las Vegas	37	38	1	2.7
U Nevada – Reno	9	41	32	355.6
U Nevada – School of Mines	1	3	2	200.0

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Table II

Change in Enrollment of Minority Freshmen in Engineering, 1992-1997

Institution	Minority Freshmen 1992-93 (N)	Minority Freshmen 1997-1998 (N)	Change 1992-93 to 1997-98 (N)	Change 1992-93 to 1997-98 (%)
U New Hampshire	0	1	1	*
U New Haven	11	12	1	9.1
U New Mexico++	138	127	-11	-8.0
U New Orleans	79	92	13	16.5
U North Carolina – Chapel Hill	0	0	0	0.0
U North Carolina – Charlotte	11	13	2	18.2
U North Dakota	0	0	0	0.0
U North Florida**	0	0	0	0.0
U Notre Dame	54	0	-54	*
U Oklahoma	214	189	-25	-11.7
U Pacific	10	11	1	10.0
U Pennsylvania	30	31	1	3.3
U Pittsburgh	37	32	-5	-13.5
U Portland	4	2	-2	-50.0
U Rhode Island	15	27	12	80.0
U Rochester	22	9	-13	-59.1
U San Diego**	0	6	6	*
U Scranton	0	0	0	0.0
U South Alabama	36	36	0	0.0
U South Carolina	115	111	-4	-3.5
U South Florida	33	72	39	118.2
U Southern California	108	128	20	18.5
U Southern Colorado	18	14	-4	-22.2
U Southern Maine	0	0	0	0.0
U Southwestern Louisiana	76	77	1	1.3
U St Thomas	0	0	0	0.0
U Tennessee – Chattanooga	0	15	15	*
U Tennessee – Knoxville	80	71	-9	-11.3
U Texas – Arlington	17	66	49	288.2
U Texas – Austin	322	181	-141	-43.8
U Texas – Dallas	7	18	11	157.1
U Texas – El Paso++	437	333	-104	-23.8
U Texas – Pan American++	0	168	168	*
U Texas – San Antonio++	82	116	34	41.5
U Toledo	35	23	-12	-34.3
U Tulsa	13	17	4	30.8
U Utah	15	9	-6	-40.0
U Vermont	3	7	4	133.3
U Virginia	47	36	-11	-23.4
U Washington	51	40	-11	-21.6
U West Florida	0	0	0	0.0
U Wisconsin – Madison	40	39	-1	-2.5
U Wisconsin – Milwaukee	16	24	8	50.0
U Wisconsin – Platteville	13	9	-4	-30.8
U Wyoming	12	19	7	58.3
Union College	3	6	3	100.0
US Air Force Academy	2	3	1	50.0
US Coast Guard Academy	11	15	4	36.4
US Merchant Marine Academy	4	7	3	75.0
US Military Academy	0	0	0	0.0
US Naval Academy	177	0	-177	*
Utah State University	7	4	-3	-42.9
Valparaiso University	3	4	1	33.3
Vanderbilt University	33	28	-5	-15.2
Villanova University	14	11	-3	-21.4
Virginia Military Institute	7	15	8	114.3
Virginia Polytechnic Institute	78	57	-21	-26.9
Walla Walla College	7	5	-2	-28.6
Washington State University	31	30	-1	-3.2
Washington University	9	17	8	88.9
Washington & Lee University	2	1	-1	-50.0
Wayne State University	85	65	-20	-23.5
Webb Institute	1	0	-1	*
Wentworth Institute of Technology	0	4	4	8.0
West Virginia Institute of Technology	3	8	5	166.7
West Virginia University	17	20	3	17.6
Western Michigan University	36	41	5	13.9
Western New England College	8	2	-6	-75.0
Wichita State University	13	8	-5	-38.5
Widener University	0	6	6	*
Wilkes University	3	1	-2	-66.7
Winona State University**	0	1	1	*
Worcester Polytechnic Institute	12	15	3	25.0
Wright State University	48	67	19	39.6
Yale University	4	0	-4	*
Youngstown State University	1	0	-1	*
National	**15,181**	**13,929**	**-1,252**	**-8.2**

*Insufficient data to compute percent change
**Institution did not report for one of the years being compared
~*Freshman do not declare major
+HBCU
++HACU

- Five HBCUs were among the 8 engineering programs, primarily in Texas and Florida, which lost in excess of 100 minority freshman engineering students.[4]

Losses > 100 Minority Freshmen

Institution	Number
Prairie View A&M University+	-344
Southern University+	-237
North Carolina A&T State University+	-190
University of Texas, Austin	-141
Texas A&M University	-130
Tuskegee University+	-127
University of Texas, El Paso**	-104
Florida A&M/Florida State University+	-103

- Only 3 universities increased their enrollments by 85 or more students.

Gains > 85 Minority Freshmen

Institution	Number
Florida International University**	+96
Cal Poly Pomona	+88
University of Maryland, College Park	+87

- American Indian freshman enrollment, which grew 5.5 percent between 1992 and 1997, remains extremely small in number with only 668 incoming students in 1997-98.

50 Institutions Graduating the Greatest Number of Minority Engineers, 1996-97 (see Table III)

Sixty-two percent of all minority engineers graduate from the 50 colleges and universities that produce the largest number of minority graduates, only 15 percent of the institutions; 26 of these institutions also graduate the largest number of nonminority engineers. Thirty-five of the institutions that graduate the largest number of minority engineers are also among the 50 institutions that enroll the largest number.

- The 50 institutions that graduate the greatest number of minority engineers graduated the majority of African Amer-

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icans (59.6 percent) and Latinos (65.8 percent), but only 40.8 percent of American Indians.

- Fourteen of the 50 institutions graduating the largest numbers of minority engineers are HBCUs or HACUs, producing an average of 130 and 77 graduates, respectively.
- North Carolina A&T State University, the highest producing institution with 256 minority graduates, surpassed its nearest competitor by more than 60 engineers.
- Of the 50 institutions, 13 had graduating classes with less than the national average of 10 percent minority representation.

Top 50 Producers, < 10 Percent Minority Graduates

Institution	Percent
U California, Davis	9
U California, Los Angeles	9
U California, San Diego	9
U Michigan, Ann Arbor	9
North Carolina State University, Raleigh	8
Clemson University	8
Purdue University	8
Auburn University	7
Cornell University	6
U California, Berkeley	6
U Illinois, Urbana Champaign	6
U Washington	6
Virginia Polytechnic Institute	5

Top 25 Engineering Institutions Ranked by Minority Freshman Enrollment, 1997-98 (see Table IVa).

Although minorities constitute 29.7 percent of all college-students, and 15.7 percent of freshman engineering enrollment at all institutions, the 25 top rated institutions identified by *U.S. News and World Report*[5] enrolled on average only 10.9 percent of these students in their freshman engineering programs.

- Underrepresented minorities constituted at least 20 percent of the freshman engineering class enrolled at three of the top institutions.

Top 25, ≥ 20 Percent Minority Freshmen

Institution	Percent
University of Southern California	23
University of Maryland, College Park	21
University of Michigan, Ann Arbor	20

- African Americans constituted the largest share of the minorities entering the Universities of Maryland and Michigan and Latinos the largest share at the University of Southern California.
- Underrepresented minorities constituted five percent or less of the enrolling freshman engineering class at four top rated institutions.

Top 25, ≤ 5 Percent Minority Freshmen

Institution	Percent
University of Wisconsin, Madison	4.6
Penn State University	4.8
Purdue University	4.9
University of Minnesota	5.0

- Nine top institutions enrolled at least 100 minority students in their freshman engineering programs.

Top 25, >100 Minority Freshmen

Institution	Number	Percent
Texas A&M University	232	13
University of Michigan, Ann Arbor	192	21
University of Texas, Austin	181	17
Georgia Institute of Technology	157	10
University of Illinois, Urbana – Champaign	142	12
University of Maryland, College Park	140	21
Ohio State University	134	11
University of Southern California	128	23
Penn State University	112	5

- Among the minority freshmen in the top 25 institutions, 45.2 percent were African American, 51.0 percent were Latino and 3.8 percent were American Indian.

Top 25 Engineering Institutions Ranked by Number of Minority Graduates, 1996-97 (see Table IVb)

The top 25 engineering institutions identified by *U.S. News and World Report* included on average only 8.6 percent minorities among their graduates, compared with 10 percent minority graduates produced on average by all institutions.

- Among the top 25 colleges and universities, 8 are among the largest producers of minority engineering graduates.
- Stanford University had the greatest minority representation in its 1996-97 graduating class at 21 percent.
- Georgia Institute of Technology graduated more minority engineers in 1997 than any other top ranked institution in absolute numbers (194).
- Three additional institutions among the top group also graduated more than 100 minority engineers.

Top 25, > 100 Minority Graduates

Institution	Number	Percent
Georgia Institute of Technology	194	16
Texas A&M University	118	11
University of Texas, Austin	118	15
Massachusetts Institute of Technology	101	16

- Although the average number of minority graduates from the top ranked institutions was 52, seven institutions graduated 15 or fewer minority engineers, far short of the average.

Top 25, ≤ 15 Minority Graduates

Institution	Number	Percent
Carnegie Mellon University	15	5
University of Minnesota	15	3
University of California, Santa Barbara	12	6
Harvard University	8	7
University of Wisconsin, Madison	8	1
California Institute of Technology	7	6
Johns Hopkins University	7	3

Institutions Graduating the Most African American, Latino and American Indian Engineers, 1996-97 (see Tables V-VII)

Of the institutions that produced the largest number of graduates from the individual underrepresented communities, two were among the institutions producing the largest number of graduates from all three minority groups and seven others were among the institutions producing the largest number of minority graduates from two underrepresented minority groups.

- Purdue University and the Massachusetts Institute of Technology were the only schools to be among the institutions producing the largest number of African American, Latino and American Indian engineers.

Table III

50 Institutions Graduating the Greatest Number of Minority Engineers, 1996-97

Institution	Rank	Total Minority (N)	Total (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)
North Carolina A&T State University*+	1	256	298	85.9	256	0	0
Georgia Institute of Technology*	2	194	1230	15.8	149	42	3
Prairie View A&M University*+	3	165	185	89.2	163	2	0
Florida International University*++	4	155	274	56.6	14	141	0
Tuskegee University*+	5	131	135	97.0	130	1	0
Texas A&M University*	6	118	1118	10.6	27	90	1
U Texas – Austin*	6	118	806	14.6	28	88	2
Cal Poly – San Luis Obispo*	8	117	666	17.6	6	109	2
Florida A&M University/Florida State University*+	9	115	254	45.3	98	17	0
U Texas – El Paso*++	10	106	178	59.6	0	105	1
CCNY – City College of New York*	11	103	256	40.2	68	35	0
Massachusetts Institute of Technology	12	101	622	16.2	38	58	5
Purdue University	13	96	1273	7.5	45	45	6
U Florida*	14	93	713	13.0	27	64	2
Southern University*+	15	92	98	93.9	92	0	0
U Michigan – Ann Arbor*	16	91	964	9.4	52	37	2
Howard University*+	17	86	90	95.6	86	0	0
New Mexico State University*++	18	79	232	34.1	3	70	6
New Jersey Institute of Technology*	19	77	372	20.7	28	49	0
Cal Poly – Pomona*	20	75	447	16.8	10	63	2
California State University – Long Beach*	20	75	369	20.4	24	49	2
North Carolina State University – Raleigh*	20	75	1000	7.5	57	12	6
U Illinois – Urbana Champaign*	23	70	1163	6.0	28	41	1
Morgan State University*+	24	66	73	90.4	66	0	0
Stanford University	25	63	298	21.1	24	35	4
Texas A&M University – Kingsville*++	25	63	113	56.8	0	63	0
U South Florida	27	58	363	16.0	24	34	0
Rensselaer Polytechnic Institute	28	57	583	9.8	26	29	2
U Southern California*	29	56	334	16.8	19	37	0
U New Mexico*++	29	56	191	29.3	2	48	6
U Maryland – College Park*	31	54	535	10.1	38	15	1
U California – Berkeley	32	50	841	5.9	12	37	1
Polytechnic University*	33	49	267	18.4	28	21	0
U Arizona*	34	48	441	10.9	2	41	5
San Jose State University*	34	48	448	10.8	13	34	1
U Central Florida	36	47	332	14.2	9	36	2
U Oklahoma*	37	46	445	10.3	23	10	13
Cornell University	38	45	764	5.9	17	27	1
U Texas – Pan American*++	38	45	54	83.3	0	44	1
Clemson University	40	44	527	8.3	41	3	0
U Washington	41	43	676	6.4	18	17	8
Arizona State University*	42	42	376	11.2	6	32	4
U Houston	43	41	242	16.9	6	34	1
San Diego State University	44	40	216	18.5	6	33	1
U California – Los Angeles	44	40	445	9.0	4	35	1
Auburn University*	46	39	579	6.7	31	4	4
California State University – Sacramento*	47	39	277	14.1	5	29	5
U California – San Diego*	47	39	417	9.4	7	30	2
U Illinois – Chicago*	47	39	314	12.4	19	20	0
U California – Davis	50	38	439	8.7	7	28	3
U Texas – San Antonio++	50	38	115	33.0	5	33	0
Virginia Polytechnic Institute	50	38	819	4.6	21	16	1
Totals		**3,959**	**24,267**		**1,908**	**1,943**	**108**
Averages		**76**	**467**	**16.3**	**37**	**37**	**2**

*Institution was one of the top 50 both in enrolling minority freshmen in engineering and graduating minority engineers.
+HBCU
++HACU

- The top institutions graduating African American and Latino engineers were: Georgia Institute of Technology, University of Illinois, Urbana-Champaign and University of Michigan, Ann Arbor.
- The top institutions graduating Latino and American Indian engineers were: New Mexico State University, University of Arizona and University of New Mexico.
- The top institution graduating African American *and* American Indian engineers was North Carolina State University, Raleigh.
- Nine of the top 20 institutions graduating African American engineers are HBCUs.
- Seven of the top 20 institutions that graduate Latino engineers are HACUs.

Conclusions

It is ironic that, at the same time as the nation's leading industries aggressively advocate for a significant rise in the visa ceiling for skilled engineering professionals, our engineering institutions are largely failing to tap the talent of groups that are almost one-third of the college-age population. With African Americans, Latinos and American Indians comprising only 10 percent of the engineering graduates, production remains concentrated in just 10 percent of the engineering institutions. Even more ominous, minority enrollments – decreasing since 1992-93 – foreshadow imminent declines in graduations, even at colleges and universities well noted for providing access.

Despite the gloomy overall picture, however, success in enrollment, retention and graduation of minority students in engineering is being achieved by all types of institutions in all parts of the country, and success stories exist at top research institutions, at large public institutions and small private ones, at institutions that serve primarily minority populations and those that are predominantly white. If their achievements are to be replicated on a broad scale, a much more extensive set of institutions will have to mobilize the leadership and resources to examine best practices and emulate key determinants of success. This means developing an understanding

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Table IVa

Top 25 Engineering Institutions* Ranked by Minority Freshman Enrollment, 1997-98

Institution	U.S. News Rank	Total Minority (N)	Total (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)
Texas A&M University	21	232	1734	13.4	54	170	8
U Michigan – Ann Arbor	4	192	944	20.3	120	67	5
U Texas – Austin	11	181	1048	17.3	26	150	5
Georgia Institute of Technology	4	157	1506	10.4	122	34	1
U Illinois – Urbana Champaign	4	142	1226	11.6	67	71	4
U Maryland – College Park	13	140	670	20.9	104	35	1
Ohio State University	25	134	1247	10.7	115	15	4
U Southern California	16	128	559	22.9	28	91	9
Pennsylvania State University	18	112	2334	4.8	62	48	2
U California – San Diego	21	100	651	15.4	19	76	5
Purdue University	8	81	1656	4.9	38	33	10
U California – Los Angeles	16	67	550	12.2	20	44	3
U California – Berkeley	2	64	713	9.0	17	44	3
Stanford University	2	51	298	17.1	21	29	1
Cornell University	8	46	735	6.3	16	25	5
Carnegie Mellon University	4	44	361	12.2	17	25	2
U California – Santa Barbara	24	43	417	10.3	4	37	2
Northwestern University	13	40	350	11.4	26	12	2
U Wisconsin – Madison	12	39	843	4.6	19	16	4
U Minnesota	18	34	681	5.0	15	18	1
Johns Hopkins University	21	23	310	7.4	17	6	0
California Institute of Technology**	8						
Harvard University**	25						
MIT**	1						
Princeton University**	13						
Totals		**2,050**	**18,833**	**10.9**	**927**	**1,046**	**77**
Averages		**98**	**897**	**10.9**	**44**	**50**	**4**

*Institutions identified by U.S. News and World Report, "America's Best Graduate Schools," 1998
**Freshmen do not declare major

Table IVb

Top 25 Engineering Institutions* Ranked by Number of Minority Graduates, 1996-97

Institution	U.S. News Rank	Total Minority (N)	Total (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)
Georgia Institute of Technology	4	194	1230	15.8	149	42	3
Texas A&M University	21	118	1118	10.6	27	90	1
U Texas – Austin	11	118	806	14.6	28	88	2
MIT	1	101	622	16.2	38	58	5
Purdue University	8	96	1273	7.5	45	45	6
U Michigan – Ann Arbor	4	91	964	9.4	52	37	2
U Illinois – Urbana Champaign	4	70	1163	6.0	28	41	1
Stanford University	2	63	298	21.1	24	35	4
U Southern California	16	56	334	16.8	19	37	0
U Maryland – College Park	13	54	535	10.1	38	15	1
U California – Berkeley	2	50	841	5.9	12	37	1
Cornell University	8	45	764	5.9	17	27	1
U California – Los Angeles	16	40	445	9.0	4	35	1
U California – San Diego	21	39	417	9.4	7	30	2
Pennsylvania State University	18	30	1157	2.3	9	21	0
Ohio State University	25	28	697	4.0	21	6	1
Princeton University	13	24	185	13.0	17	5	2
Northwestern University	13	20	317	6.3	12	8	0
Carnegie Mellon University	4	15	279	5.4	9	6	0
U Minnesota	18	15	573	2.6	9	5	1
U California – Santa Barbara	24	12	190	6.3	2	10	0
Harvard University	25	8	114	7.0	5	3	0
U Wisconsin – Madison	12	8	615	1.3	4	3	1
California Institute of Technology	8	7	113	6.2	0	7	0
Johns Hopkins University	21	7	234	3.0	5	2	0
Totals		**1,309**	**15,284**		**581**	**693**	**35**
Averages		**52**	**611**	**8.6**	**23**	**28**	**1**

*Institutions identified by U.S. News and World Report, "America's Best Graduate Schools," 1998

of how schools that create access work with the precollege community to build the pool of minority candidates for recruitment. It means learning what policies and expectations can be put in place to impact the number and potential success of incoming freshmen. It means recognizing that institutional commitment, reflected in plans and budget for the sophomore class, enhances the likelihood of minority student retention. And, given the lack of correlation between minority student performance and standardized test scores,[5] it means appreciating that the most successful institutions are using alternative assessment techniques to deepen the talent pool.

NACME's *Engineering Vanguard Program*, for example, is assisting growing numbers of engineering institutions in addressing several of these issues. *Vanguard* increases the number of minority students who pursue engineering by providing new kinds of opportunities to demonstrate engineering promise. Working at target high schools in areas that are largely bypassed by traditional college recruiting activities, NACME uses a highly interactive performance-based process to assess content knowledge, mathematics problem-solving behaviors and critical thinking skills. To bridge the gap between the coursework that is available in inner-city schools and the content students are presumed to know on entering an engineering institution, identified students are immersed in rigorous, intensely focused academic workshops during their senior year in high school. By the program's end, students coalesce into high functioning, academic teams with whom they matriculate as a unit in engineering schools with scholarships covering full tuition and housing. Now in its sixth year, *Vanguard* has not lost a single scholar, and many are earning academic honors. Programs like *Vanguard* provide solid evidence of existing practices that are capable of injecting large numbers of minority freshmen who have a high probability of success into the nation's engineering institutions.

Even as we catalog a set of best practices, however, we must recognize that access is driven by the organizations that set the standard for engineering education. Today's engineers, the high performers that industry and government are seeking to recruit, are not only skilled technically. They are also expected to be top producing team players experienced in working and communicating across racial, ethnic and gender boundaries and able to represent their com-

Table V
Institutions Graduating the Most African American Engineers, 1996-97

Institution	Rank	African American (#)
North Carolina A&T State University+	1	256
Prairie View A&M University+	2	163
Georgia Institute of Technology	3	149
Tuskegee University+	4	130
Florida A&M University/Florida State University+	5	98
Southern University+	6	92
Howard University+	7	86
CCNY – City College of New York	8	68
Morgan State University+	9	66
North Carolina State University – Raleigh	10	57
U Michigan – Ann Arbor	11	52
Purdue University	12	45
Clemson University	13	41
U Maryland – College Park	14	38
Massachusetts Institute of Technology	14	38
Tennessee State University+	16	37
Auburn University	17	31
U South Carolina	17	31
U Virginia	19	29
U District of Columbia+	20	28
U Illinois – Urbana Champaign	20	28
New Jersey Institute of Technology	20	28
Polytechnic University	20	28
U Texas – Austin	20	28

+HBCU

Table VI
Institutions Graduating the Most Latino Engineers, 1996-97

Institution	Rank	Latino (#)
Florida International University++	1	141
Cal Poly – San Luis Obispo	2	109
U Texas – El Paso++	3	105
Texas A&M University	4	90
U Texas – Austin	5	88
New Mexico State University++	6	70
U Florida	7	64
Cal Poly – Pamona	8	63
Texas A&M University – Kingsville++	8	63
Massachusetts Institute of Technology	10	58
California State University – Long Beach	11	49
New Jersey Institute of Technology	11	49
U New Mexico++	13	48
Purdue University	14	45
U Texas – Pan American++	15	44
Georgia Institute of Technology	16	42
U Arizona	17	41
U Illinois – Urbana Champaign	17	41
U California – Berkeley	19	37
U Southern California	19	37
U Michigan – Ann Arbor	19	37

++HACU

panies in the global workplace. These are skills that cannot be learned in homogeneous institutions. As the Accreditation Board for Engineering and Technology (ABET), and the engineering societies that support it, test and finalize the ABET Engineering 2000 criteria, they must recognize explicitly that engineering students trained in institutions without significant diversity will be unprepared to compete and contribute effectively in today's engineering environment. Diversity on campus is critical to the production of a high-achieving engineering work force – minority and nonminority.

Similarly, organizations like *U.S. News and World Report* that seek to set the national standard in defining world class academic institutions must take into account that colleges and universities ignoring a third of the population cannot continue to be ranked among the nation's best.

Organizations that develop rankings, however, are not alone in their ability to shape institutional policies. The colleges and universities that are among the top ranked academically are also among the top ranked in dollars received for private and federal research. As significant recipients of taxpayer dollars, these institutions must be held accountable by contracting and grant-making agencies for educating a population reflective of the American people. This can be accomplished by linking their substantial tax-supported funding to achievements in diversifying their graduating classes and tenure-track faculties, and by including clearly defined human resources outcomes among the criteria for evaluating funding proposals.

In the longer term, however, capitalizing on all the nation's human resources, will require a sea change in our legislators' policy stance on national education standards. Right now, only six percent of minority students and 15 percent of all students take mathematics through calculus and science through physics in high school. These are the basic tools needed by high school graduates in the 21st century economy, not only for science and engineering but for landing a job in a modern factory. In Eastern Europe and the Pacific Rim, our competitor nations which provide rigorous academic training as a matter of course will surely draw jobs away from this country if we cannot field a competitive work force. Absent a greater national commitment to mandate precollege mathematics and science, more and more college and university departments will compete for the limited pool of minority college students with advanced training, at the expense of throughput in the nation's engineering pipeline. Already, we're seeing the impact at the HBCUs, where enrollment overall has remained relatively stable while enrollment in engineering has undergone a structural decline. The issue is one of national economic development and requires policy solutions that embrace the need for a human resources strategy for science and technology in the global market.

Finally, in the current anti-affirmative action climate, policy makers in government as well as in colleges and universities must learn from the experiences of Texas and

California that they will certainly damage the economic viability of their communities and the intellectual vitality of their educational institutions if they do not assure ongoing access in the face of current challenges. This means meticulously reviewing all existing programs to ensure that they are structured to achieve diversity within legal guidelines and therefore outside the sights of such organizations as the Center for Individual Rights, which seek out legally flawed programs as targets.[7] More importantly, however, it means educators and employers must band together in taking a strong vocal stand in support of policies that benefit work force potential, economic competitiveness and social justice.

Engineering, the major engine of wealth creation and economic development in the United States, continues to be unavailable to large numbers of Americans. That only 10 percent of our engineering institutions provide significant access to African Americans, Latinos and American Indians – and the vast majority of these remain far short of achieving parity – is a national embarrassment on the verge of becoming an economic disaster. Engineering needs the fuel of all, not merely some, of our people to propel the country to the frontiers of innovation, production and distribution, hallmarks of a world class economy. A quick look at the data offers a strong set of models for institutions willing to benchmark engineering programs that have proven effective in enrolling minority students, maximizing their retention and graduating growing numbers of minority engineers. Our challenge on the eve of the new millennium is to vigorously expand the number of institutions accountable for providing access and rigorously keep score of the number of students they serve.

Table VII
Institutions Graduating the Most American Indian Engineers, 1996-97

Institution	Rank	American Indian (#)
U Oklahoma	1	13
Northern Arizona University	2	12
Oklahoma State University	3	8
U Washington	3	8
Colorado School of Mines	5	7
Purdue University	6	6
New Mexico State University++	6	6
U New Mexico++	6	6
North Carolina State University – Raleigh	6	6
U Arizona	10	5
California State University – Sacramento	10	5
Massachusetts Institute of Technology	10	5
Auburn University	13	4
U Alaska – Anchorage	13	4
U Alaska – Fairbanks	13	4
Arizona State University	13	4
Stanford University	13	4
US Air Force Academy	13	4
US Naval Academy	13	4
Michigan Technological University	13	4
U Tulsa	13	4
Washington State University	13	4
++HACU		

Endnotes

1. Engineering Workforce Commission, *Engineering & Technology Degrees 1997,* Washington, DC, 1997.
   Engineering Workforce Commission, *Engineering & Technology Enrollments, Fall, 1997,* Washington, DC, 1998.
2. Morrison, C., Griffin, K., Marcotullio, P. "Retention of Minority Students in Engineering: Institutional Variability and Success." *NACME Research Letter,* Vol. 5, No. 2, NACME, New York, NY, December, 1995, p.3.
3. NACME, Inc., *Crisis & Commitment.* Annual Report, 1997, p.4.
4. +identifies institution as a Historically Black College or University (HBCU)
   ++identifies institution as a member of Hispanic Association of Colleges and Universities (HACU).
5. *U.S. News and World Report,* "America's Best Graduate Schools," 1998.
6. Derek Bok and William G. Bowen, *The Shape of the River: Long-Term Consequences of Considering Race in College and University Admissions,* Princeton University Press, 1998.
7. George Campbell Jr., "Engineering and Affirmative Action: Crisis in the Making," *NACME Research Letter,* Special Edition, NACME, New York, November 1997, pp. 12, 13.

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Table VIII, Appendix A

Enrollment of Minority Freshmen in Engineering, All Institutions, 1997-98

Institution	Rank	Total Minority (N)	Total Freshmen (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)
Alabama A&M University+	169	17	17	100.0	17	0	0
Alfred University/SUNY Ceramics	247	4	111	3.6	1	3	0
Arizona State University	40	116	493	23.5	16	70	30
Arkansas State University	288	0	106	0.0	0	0	0
Arkansas Tech University	255	3	51	5.9	3	0	0
Auburn University	46	105	993	10.6	91	6	8
Baylor University	184	14	61	23.0	4	9	1
Boston University	149	23	294	7.8	5	18	0
Bradley University	255	3	135	2.2	2	1	0
Brigham Young University	130	28	577	4.9	3	20	5
Brown University	149	23	132	17.4	14	9	0
Bucknell University	218	8	199	4.0	8	0	0
California Institute of Technology**	288						
California Maritime Academy	255	3	30	10.0	0	3	0
Cal Poly – Pomona	16	173	647	26.7	22	149	2
Cal Poly – San Luis Obispo	13	183	1088	16.8	22	144	17
California State University – Chico	135	27	146	18.5	10	15	2
California State University – Fresno	54	85	206	41.3	12	70	3
California State University – Fullerton	79	56	118	47.5	12	42	2
California State University – Long Beach	22	148	377	39.3	47	100	1
California State University – Los Angeles++	31	128	174	73.6	9	118	1
California State University – Northridge	15	180	416	43.3	53	125	2
California State University – Sacramento	50	89	342	26.0	33	50	6
Calvin College	288	0	91	0.0	0	0	0
Capitol College	169	17	24	70.8	16	1	0
Carnegie Mellon University	92	44	361	12.2	17	25	2
Case Western Reserve University	255	3	17	17.6	2	1	0
Catholic University of America	213	9	58	15.5	6	2	1
CCNY – City College of New York	4	269	455	59.1	109	160	0
Cedarville College	265	2	69	2.9	2	0	0
Central State University+	178	15	15	100.0	15	0	0
Christian Brothers University	161	18	85	21.2	18	0	0
Citadel	222	7	82	8.5	4	3	0
Clarkson University	203	11	363	3.0	8	3	0
Clemson University	51	88	747	11.8	80	7	1
Cleveland State University	169	17	154	11.0	11	6	0
Cogswell College	288	0	23	0.0	0	0	0
College of New Jersey	208	10	101	9.9	5	5	0
College of Staten Island	222	7	37	18.9	3	4	0
Colorado School of Mines	63	75	657	11.4	12	56	7
Colorado State University	161	18	287	6.3	5	10	3
Colorado Technical University	213	9	56	16.1	3	6	0
Columbia University	141	25	310	8.1	17	8	0
Cooper Union	203	11	118	9.3	4	7	0
Cornell University	88	46	735	6.3	16	25	5
Dartmouth College	169	17	133	12.8	5	6	6
Dordt College	288	0	34	0.0	0	0	0
Drexel University	51	88	738	11.9	70	16	2
Duke University	184	14	277	5.1	9	5	0
Embry Riddle Aeronautical University	67	67	431	15.5	26	40	1
Embry Riddle University – Prescott	208	10	187	5.3	3	6	1
Fairfield University	265	2	12	16.7	1	1	0
Fairleigh Dickinson University	247	4	9	44.4	3	1	0
Florida A&M University/Florida State University+	8	229	458	50.0	209	19	1
Ferris State University	288	0	5	0.0	0	0	0
Florida Atlantic University	73	64	191	33.5	40	24	0
Florida Institute of Technology	149	23	243	9.5	8	15	0
Florida International University++	27	139	211	65.9	24	115	0
Gannon University	279	1	28	3.6	1	0	0
Geneva College	231	6	46	13.0	3	2	1
George Mason University	82	50	256	19.5	29	20	1
George Washington University	139	26	163	16.0	17	9	0
Georgia Institute of Technology	20	157	1506	10.4	122	34	1
GMI Engineering & Management Institute	82	50	581	8.6	38	11	1
Gonzaga University	288	0	62	0.0	0	0	0
Grand Valley State University	161	18	137	13.1	15	3	0
Grove City College	288	0	92	0.0	0	0	0
Hampton University+	57	81	81	100.0	81	0	0
Harvard University**	288						
Harvey Mudd College	239	5	75	6.7	0	3	2
Henry Cogswell College	288	0	3	0.0	0	0	0
Hofstra University	143	24	77	31.2	11	13	0
Howard University+	25	141	181	77.9	141	0	0
Humboldt State University	265	2	24	8.3	0	2	0
Idaho State University	239	5	75	6.7	0	3	2
Illinois Institute of Technology	112	35	222	15.8	20	14	1
Indiana Institute of Technology	208	10	59	16.9	8	2	0
Indiana University/Purdue University – Ft Wayne	239	5	87	5.7	1	4	0
Indiana University/Purdue University – Indianapolis	279	1	27	3.7	1	0	0
Institute of Paper Science & Technology	288	0	0	0.0	0	0	0
Iowa State University	84	48	1274	3.8	27	20	1
John Brown University	288	0	30	0.0	0	0	0
Johns Hopkins University	149	23	310	7.4	17	6	0
Kansas State University	87	47	731	6.4	24	14	9
Lafayette College	184	14	136	10.3	8	6	0
Lamar University	105	38	187	20.3	28	7	3
Lawrence Technological University	139	26	235	11.1	26	0	0
Le Tourneau University	265	2	60	3.3	0	2	0
Lehigh University	193	13	366	3.6	6	7	0
Loras College	265	2	14	14.3	0	2	0
Louisiana State University	39	118	805	14.7	95	20	3
Louisiana Technical University	84	48	372	12.9	42	3	3
Loyola College	265	2	17	11.8	2	0	0
Loyola Marymount University	130	28	90	31.1	8	19	1
Maine Maritime Academy	288	0	12	0.0	0	0	0
Manhattan College	143	24	109	22.0	6	18	0
Mankato State University	288	0	99	0.0	0	0	0
Marietta College	255	3	19	15.8	3	0	0
Marquette University	193	13	291	4.5	5	8	0

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Institution	Rank	Total Minority (N)	Total Freshmen (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)
Massachusetts Institute of Technology**	288						
Massachusetts Maritime Academy	265	2	63	3.2	1	1	0
McNeese State University	156	21	134	15.7	19	2	0
Mercer University	154	22	125	17.6	21	1	0
Merrimack College	288	0	37	0.0	0	0	0
Messiah College	279	1	39	2.6	1	0	0
Miami University	200	12	123	9.8	8	3	1
Michigan State University	3	271	1323	20.5	230	32	9
Michigan Technological University	118	33	1007	3.3	15	7	11
Milwaukee School of Engineering	135	27	385	7.0	14	11	2
Mississippi State University	29	132	550	24.0	126	2	4
Monmouth University	288	0	0	0.0	0	0	0
Montana State University	203	11	446	2.5	0	0	11
Montana Tech of the University of Montana	239	5	208	2.4	0	1	4
Morgan State University+	9	222	236	94.1	222	0	0
National Technical University	288	0	0	0.0	0	0	0
New Jersey Institute of Technology	35	126	471	26.8	64	61	1
New Mexico Highlands University++	154	22	28	78.6	2	20	0
New Mexico Institute of Mining & Technology	119	32	113	28.3	1	24	7
New Mexico State University++	17	170	352	48.3	4	152	14
New York Institute of Technology	109	36	105	34.3	21	15	0
Norfolk State University+	178	15	15	100.0	15	0	0
North Carolina A&T State University+	6	264	288	91.7	264	0	0
North Carolina State University – Raleigh	10	199	1273	15.6	160	29	10
North Dakota State University	231	6	323	1.9	2	1	3
Northeastern State University	279	1	2	50.0	0	0	1
Northeastern University	112	35	367	9.5	20	14	1
Northern Arizona University	73	64	265	24.2	2	22	40
Northern Illinois University	77	59	250	23.6	43	15	1
Northwestern University	100	40	350	11.4	26	12	2
Norwich University	279	1	80	1.3	1	0	0
Oakland University	100	40	309	12.9	34	6	0
Ohio Northern University	255	3	129	2.3	3	0	0
Ohio State University	28	134	1247	10.7	115	15	4
Ohio University	184	4	284	1.4	10	4	0
Oklahoma Christian University	239	5	42	11.9	3	0	2
Oklahoma State University	90	45	415	10.8	13	5	27
Old Dominion University	122	31	169	18.3	26	4	1
Oral Roberts University	288	0	29	0.0	0	0	0
Oregon State University	288	0	572	0.0	0	0	0
Pacific Lutheran University*	288	0	0	0.0	0	0	0
Parks College – St Louis University	193	13	82	15.9	7	6	0
Pennsylvania State University	42	112	2334	4.8	62	48	2
Philadelphia College of Textiles	288	0	6	0.0	0	0	0
Polytechnic University	23	143	607	23.6	67	70	6
Portland State University	193	13	144	9.0	1	9	3
Prairie View A&M University+	30	130	136	95.6	130	0	0
Princeton University**	288						
Purdue University – Calumet	159	19	85	22.4	4	15	0
Purdue University	57	81	1656	4.9	38	33	10
Rensselaer Polytechnic University	59	49	737	6.6	30	45	4
Rice University	96	42	234	17.9	14	26	2
Rochester Institute of Technology	112	35	383	9.1	20	12	3
Rose – Hulman Institute of Technology	222	7	324	2.2	4	2	1
Rutgers University	33	127	639	19.9	71	55	1
Saginaw Valley State University	184	14	52	26.9	11	0	3
San Diego State University	60	78	266	29.3	21	57	0
San Francisco State University	208	10	84	11.9	2	8	0
San Jose State University	48	97	543	17.9	40	55	2
Santa Clara University	119	32	204	15.7	3	26	3
South Dakota School of Mines & Technology	184	14	373	3.8	1	5	8
South Dakota State University	265	2	331	0.6	0	1	1
Seattle Pacific University	265	2	34	5.9	1	1	0
Seattle University	222	7	65	10.8	3	2	2
Southern Illinois University – Carbondale	88	46	212	21.7	43	2	1
Southern Illinois University – Edwardsville	265	2	35	5.7	1	1	0
Southern Methodist University	126	30	138	21.7	13	17	0
Southern University+	1	336	343	98.0	329	0	7
St Ambrose University	288	0	3	0.0	0	0	0
St Cloud State University	265	2	48	4.2	2	0	0
St Martins College	288	0	7	0.0	0	0	0
St Marys University++	128	29	46	63.0	1	28	0
Stanford University	81	51	298	17.1	21	29	1
Stevens Institute of Technology	90	45	231	19.5	10	34	1
SUNY – Binghamton Campus	222	7	122	5.7	2	5	0
SUNY – Buffalo Campus	54	85	556	15.3	49	28	8
SUNY – Stony Brook Campus	175	16	69	23.2	9	7	0
SUNY – College at New Paltz	231	6	22	27.3	2	4	0
SUNY – College of Environmental Science	288	0	21	0.0	0	0	0
SUNY – Maritime College	288	0	76	0.0	0	0	0
Swarthmore College	239	5	31	16.1	3	2	0
Syracuse University	143	24	226	10.6	16	8	0
Temple University	100	40	72	55.6	33	6	1
Tennessee State University+	5	266	279	95.3	266	0	0
Tennessee Technical University	156	21	325	6.5	17	1	3
Texas A&M University – Galveston	288	0	23	0.0	0	0	0
Texas A&M University	7	232	1734	13.4	54	170	8
Texas A&M University – Kingsville++	38	119	165	72.1	8	108	3
Texas Tech University	62	76	596	12.8	24	50	2
Trinity College	288	0	1	0.0	0	0	0
Trinity University*	288	0	0	0.0	0	0	0
Tri – State University	247	4	157	2.5	1	2	1
Tufts University	231	6	207	2.9	5	1	0
Tulane University	184	14	210	6.7	11	3	0
Tuskegee University+	21	152	154	98.7	151	1	0
U Akron	122	31	362	8.6	25	6	0
U Akron – Polymer Science*	288	0	0	0.0	0	0	0
U Alabama	37	120	536	22.4	117	2	1
U Alabama – Birmingham	107	37	115	32.2	37	0	0

Table VIII, Appendix A

Enrollment of Minority Freshmen in Engineering, All Institutions, 1997-98

Continued

Institution	Rank	Total Minority (N)	Total Freshmen (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)
U Alabama – Huntsville	96	42	241	17.4	33	2	7
U Alaska – Anchorage	265	2	26	7.7	0	0	2
U Alaska – Fairbanks	222	7	63	11.1	2	2	3
U Arizona	36	122	561	21.7	11	94	17
U Arkansas	80	53	367	14.4	36	9	8
U Bridgeport	247	4	25	16.0	2	2	0
U California – Berkeley	73	64	713	9.0	17	44	3
U California – Davis	64	74	645	11.5	17	52	5
U California – Irvine	84	48	390	12.3	8	40	0
U California – Los Angeles	67	67	550	12.2	20	44	3
U California – Riverside	161	18	95	18.9	0	16	2
U California – San Diego	47	100	651	15.4	19	76	5
U California – Santa Barbara	94	43	417	10.3	4	37	2
U California – Santa Cruz	141	25	105	23.8	4	21	0
U Central Florida	54	85	404	21.0	40	45	0
U Cincinnati	130	28	467	6.0	24	3	1
U Colorado – Boulder	76	60	623	9.6	9	47	4
U Colorado – Colorado Springs	175	16	145	11.0	5	10	1
U Colorado – Denver	218	8	48	16.7	0	7	1
U Connecticut	161	18	179	10.1	8	9	1
U Dayton	130	28	310	9.0	17	8	3
U Delaware	92	44	320	13.8	29	12	3
U Denver	255	3	50	6.0	2	1	0
U Detroit Mercy	115	34	112	30.4	20	13	1
U District of Columbia+	128	29	34	85.3	25	4	0
U Evansville	231	6	85	7.1	5	1	0
U Florida	18	169	896	18.9	71	94	4
U Georgia	255	3	27	11.1	3	0	0
U Hartford	200	12	119	10.1	9	3	0
U Hawaii	208	10	139	7.2	0	2	8
U Houston	53	86	245	35.1	34	50	2
U Idaho	239	5	231	2.2	1	3	1
U Illinois – Chicago	45	107	414	25.8	33	72	2
U Illinois – Urbana Champaign	24	142	1226	11.6	67	71	4
U Iowa	184	14	377	3.7	2	10	2
U Kansas	135	27	480	5.6	12	11	4
U Kentucky	115	34	441	7.7	31	3	0
U Louisville	122	31	297	10.4	26	4	1
U Lowell	161	18	210	8.6	8	10	0
U Maine – Orono	222	7	197	3.6	1	1	5
U Maryland – Baltimore County	70	66	322	20.5	62	2	2
U Maryland – College Park	26	140	670	20.9	104	35	1
U Massachusetts – Amherst	143	24	287	8.4	14	10	0
U Massachusetts – Dartmouth	193	13	208	6.3	6	3	4
U Memphis	175	16	69	23.2	15	0	1
U Miami	44	108	250	43.2	47	59	2
U Michigan – Ann Arbor	11	192	944	20.3	120	67	5
U Michigan – Dearborn	161	18	277	6.5	8	5	5
U Minnesota	115	34	681	5.0	15	18	1
U Minnesota – Duluth	247	4	105	3.8	2	0	2
U Mississippi	107	37	212	17.5	35	2	0
U Missouri – Columbia & Kansas City	94	43	431	10.0	37	5	1
U Missouri – Rolla	143	24	613	3.9	16	4	4
U Nebraska – Lincoln	193	13	393	3.3	7	4	2
U Nevada – Las Vegas	105	38	174	21.8	18	19	1
U Nevada – Reno	98	41	260	15.8	9	28	4
U Nevada – School of Mines	255	3	28	10.7	0	2	1
U New Hampshire	279	1	152	0.7	0	1	0
U New Haven	200	12	78	15.4	9	3	0
U New Mexico++	33	127	296	42.9	12	92	23
U New Orleans	49	92	261	35.2	57	20	15
U North Carolina – Chapel Hill*	288	0	0	0.0	0	0	0
U North Carolina – Charlotte	193	13	194	6.7	10	2	1
U North Dakota	288	0	98	0.0	0	0	0
U North Florida	288	0	0	0.0	0	0	0
U Oklahoma	12	189	596	31.7	101	48	40
U Pacific	203	11	49	22.4	2	8	1
U Pennsylvania	122	31	319	9.7	14	17	0
U Pittsburgh	119	32	396	8.1	27	5	0
U Portland	265	2	84	2.4	1	1	0
U Rhode Island	135	27	219	12.3	11	15	1
U Rochester	21[illegible]	9	108	8.3	4	5	0
U San Diego**	231	6	38	15.8	1	5	0
U Scranton	288	0	9	0.0	0	0	0
U South Alabama	109	36	186	19.4	32	4	0
U South Carolina	43	111	362	30.7	102	9	0
U South Florida	65	72	314	22.9	27	44	1
U Southern California	31	128	559	22.9	28	91	9
U Southern Colorado	184	14	33	42.4	0	14	0
U Southern Maine	288	0	5	0.0	0	0	0
U Southwestern Louisiana	61	77	386	19.9	66	8	3
U St Thomas*	288	0	0	0.0	0	0	0
U Tennessee – Chattanooga	178	15	62	24.2	14	1	0
U Tennessee – Knoxville	66	71	540	13.1	58	10	3
U Texas – Arlington	70	66	344	19.2	24	38	4
U Texas – Austin	14	181	1048	17.3	26	150	5
U Texas – Dallas	161	18	197	9.1	8	9	1
U Texas – El Paso++	2	333	472	70.6	7	326	0
U Texas – Pan American++	19	168	211	79.6	0	167	1
U Texas – San Antonio++	40	116	193	60.1	8	108	0

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Institution	Rank	Total Minority (N)	Total Freshmen (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)
U Toledo	149	23	530	4.3	16	6	1
U Tulsa	169	17	146	11.6	7	4	6
U Utah	213	9	275	3.3	0	9	0
U Vermont	222	7	137	5.1	2	5	0
U Virginia	109	36	541	6.7	24	12	0
U Washington	100	40	366	10.9	19	18	3
U West Florida*	288	0	0	0.0	0	0	0
U Wisconsin – Madison	104	39	843	4.6	19	16	4
U Wisconsin – Milwaukee	143	24	269	8.9	13	9	2
U Wisconsin – Platteville	213	9	453	2.0	2	4	3
U Wyoming	159	19	248	7.7	4	14	1
Union College	231	6	62	9.7	3	3	0
US Air Force Academy	255	3	14	21.4	0	3	0
US Coast Guard Academy	178	15	124	12.1	6	9	0
US Merchant Marine Academy	222	7	153	4.6	3	4	0
US Military Academy*	288	0	0	0.0	0	0	0
US Naval Academy*	288	0	0	0.0	0	0	0
Utah State University	247	4	163	2.5	0	4	0
Valparaiso University	247	4	84	4.8	1	2	1
Vanderbilt University	130	28	339	8.3	14	14	0
Villanova University	203	11	227	4.8	4	7	0
Virginia Military Institute	178	15	113	13.3	11	4	0
Virginia Polytechnic Institute	78	57	1057	5.4	39	16	2
Walla Walla College	239	5	56	8.9	2	3	0
Washington State University	126	30	537	5.6	8	14	8
Washington University	169	17	239	7.1	12	5	0
Washington & Lee University	279	1	10	10.0	1	0	0
Wayne State University	72	65	156	41.7	56	9	0
Webb Institute	288	0	24	0.0	0	0	0
Wentworth Institute of Technology	247	4	59	6.8	2	2	0
West Virginia Institute of Technology	218	8	168	4.8	6	0	2
West Virginia University	158	20	475	4.2	14	5	1
Western Michigan University	98	41	275	14.9	31	9	1
Western New England College	265	2	78	2.6	0	2	0
Wichita State University	218	8	160	5.0	4	3	1
Widener University	231	6	53	11.3	6	0	0
Wilkes University	279	1	52	1.9	0	1	0
Winona State University	279	1	56	1.8	1	0	0
Worcester Polytechnic Institute	178	15	409	3.7	4	11	0
Wright State University	67	67	442	15.2	64	3	0
Yale University	288	0	1	0.0	0	0	0
Youngstown State University	288	0	241	0.0	0	0	0
National		**13,929**	**88,972**	**15.7**	**7,403**	**5,858**	**668**

*Institution did not report 1997 freshman engineering enrollment
**Freshman do not declare major
+HBCU
++HACU

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Table IX, Appendix B

Production of Minority Engineering Graduates, All Institutions, 1996-97

Institution	Rank	Total Minority (N)	Total Graduates (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)
Alabama A&M University+	220	3	5	60.0	3	0	0
Alfred University/SUNY:Ceramics	175	7	84	8.3	5	2	0
Arizona State University	42	42	376	11.2	6	32	4
Arkansas State University	262	1	26	3.8	1	0	0
Arkansas Technical University	286	0	25	0.0	0	0	0
Auburn University	46	39	579	6.7	31	4	4
Baylor University	220	3	23	13.0	0	3	0
Boston University	87	21	271	7.7	4	17	0
Bradley University	220	3	150	2.0	1	2	0
Brigham Young University	123	12	408	2.9	0	9	3
Brown University	199	5	78	6.4	3	2	0
Bucknell University	239	2	117	1.7	2	0	0
California Institute of Technology	175	7	113	6.2	0	7	0
California Maritime Academy	286	0	13	0.0	0	0	0
Cal Poly – Pomona	20	75	447	16.8	10	63	2
Cal Poly – San Luis Obispo	8	117	666	17.6	6	109	2
California State University – Chico	145	10	91	11.0	2	7	1
California State University – Fresno	77	24	128	18.8	2	21	1
California State University – Fullerton	123	12	79	15.2	1	10	1
California State University – Long Beach	20	75	369	20.3	24	49	2
California State University – Los Angeles++	60	32	93	34.4	3	29	0
California State University – Northridge	57	34	184	18.5	11	23	0
California State University – Sacramento	46	39	277	14.1	5	29	5
Calvin College	286	0	53	0.0	0	0	0
Capitol College	199	5	29	17.2	4	1	0
Carnegie Mellon University	106	15	279	5.4	9	6	0
Case Western Reserve University	104	17	289	5.9	12	4	1
Catholic University of America	220	3	50	6.0	2	1	0
CCNY–City College of New York	11	103	256	40.2	68	35	0
Cedarville College	286	0	37	0.0	0	0	0
Central State University+	239	2	6	33.3	2	0	0
Christian Brothers University	239	2	38	5.3	2	0	0
Citadel	199	5	67	7.5	5	0	0
Clarkson University	175	7	302	2.3	1	3	3
Clemson University	40	44	527	8.3	41	3	0
Cleveland State University	163	8	136	5.9	4	2	2
Cogswell College	262	1	18	5.6	0	1	0
College of New Jersey	220	3	21	14.3	1	2	0
College of Staten Island	286	0	1	0.0	0	0	0
Colorado School of Mines	66	29	460	6.3	2	20	7
Colorado State University	145	10	238	4.2	0	9	1
Colorado Technical University	262	1	30	3.3	1	0	0
Columbia University	106	15	237	6.3	6	9	0
Cooper Union	134	11	127	8.7	5	6	0
Cornell University	38	45	764	5.9	17	27	1
Dartmouth College	188	6	120	5.0	2	1	3
Dordt College	286	0	20	0.0	0	0	0
Drexel University	91	20	396	5.1	13	7	0
Duke University	95	19	200	9.5	13	6	0
Embry Riddle Aeronautical University	175	7	96	7.3	1	6	0
Embry Riddle University – Prescott	220	3	70	4.3	0	2	1
Fairfield University	211	4	30	13.3	4	0	0
Fairleigh Dickinson University	262	1	6	16.7	0	1	0
Florida A&M University/Florida State University+	9	115	254	45.3	98	17	0
Ferris State University	286	0	20	0.0	0	0	0
Florida Atlantic University	54	35	167	21.0	20	13	2
Florida Institute of Technology	134	11	122	9.0	3	8	0
Florida International University++	4	155	274	56.6	14	141	0
Gannon University	262	1	30	3.3	1	0	0
Geneva College	262	1	17	5.9	1	0	0
George Mason University	87	21	206	10.2	13	8	0
George Washington University	123	12	70	17.1	7	5	0
Georgia Institute of Technology	2	194	1230	15.8	149	42	3
GMI Engineering and Management Institute	74	25	423	5.9	16	8	1
Gonzaga University	239	2	53	3.8	0	0	2
Grand Valley State University	220	3	33	9.1	1	1	1
Grove City College	286	0	55	0.0	0	0	0
Hampton University+	95	19	20	95.0	19	0	0
Harvard University	163	8	114	7.0	5	3	0
Harvey Mudd College	188	6	63	9.5	1	5	0
Henry Cogswell College	286	0	8	0.0	0	0	0
Hofstra University	199	5	38	13.2	0	5	0
Howard University+	17	86	90	95.6	86	0	0
Humboldt State University	239	2	49	4.1	0	1	1
Idaho State University	262	1	26	3.8	0	0	1
Illinois Institute of Technology	60	32	245	13.1	22	10	0
Indiana Institute of Technology	239	2	13	15.4	2	0	0
Indiana University/Purdue University – Ft Wayne	262	1	32	3.1	1	0	0
Indiana University/Purdue University – Indianapolis	220	3	70	4.3	1	1	1
Institute of Paper Science & Technology*	286	0	0	0.0	0	0	0
Iowa State University	114	14	692	2.0	10	4	0
John Brown University	286	0	18	0.0	0	0	0
Johns Hopkins University	175	7	234	3.0	5	2	0
Kansas State University	163	8	296	2.7	2	6	0
Lafayette College	220	3	102	2.9	2	1	0
Lamar University	118	13	96	13.5	8	5	0
Lawrence Technological University	118	13	260	5.0	7	5	1
Le Tourneau University	262	1	45	2.2	0	0	1
Lehigh University	118	13	321	4.0	6	6	1
Loras College	286	0	2	0.0	0	0	0
Louisiana State University	66	29	326	8.9	17	10	2
Louisiana Tech University	83	22	166	13.3	19	3	0

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Institution	Rank	Total Minority (N)	Total Graduates (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)
Loyola College	262	1	7	14.3	1	0	0
Loyola Marymount University	123	12	51	23.5	0	12	0
Maine Maritime Academy	286	0	9	0.0	0	0	0
Manhattan College	77	24	147	16.3	8	16	0
Mankato State University	262	1	37	2.7	0	0	1
Marietta College	286	0	7	0.0	0	0	0
Marquette University	163	8	261	3.1	4	4	0
Massachusetts Institute of Technology	12	101	622	16.2	38	58	5
Massachusetts Maritime Academy	239	2	95	2.1	1	0	1
McNeese State University	220	3	35	8.6	3	0	0
Mercer University	145	10	85	11.8	9	1	0
Merrimack College	262	1	23	4.3	0	1	0
Messiah College	286	0	24	0.0	0	0	0
Miami University	211	4	94	4.3	3	1	0
Michigan State University	54	35	563	6.2	27	6	2
Michigan Technological University	106	15	798	1.9	7	4	4
Milwaukee School of Engineering	156	9	241	3.7	4	3	2
Mississippi State University	74	25	303	8.3	22	3	0
Monmouth College	286	0	4	0.0	0	0	0
Montana State University	220	3	229	1.3	0	3	0
Montana Technical Institute of U Montana	239	2	160	1.3	0	2	0
Morgan State University+	24	66	73	90.4	66	0	0
National Technical University*	286	0	0	0.0	0	0	0
New England College	286	0	1	0.0	0	0	0
New Jersey Institute of Technology	19	77	372	20.7	28	49	0
New Mexico Highlands University++	220	3	3	100.0	0	2	1
New Mexico Institute of Mining & Technology	106	15	65	23.1	0	14	1
New Mexico State University++	18	79	232	34.1	3	70	6
New York Institute of Technology	87	21	89	23.6	12	8	1
Norfolk State University+	188	6	6	100.0	6	0	0
North Carolina A&T State University+	1	256	298	85.9	256	0	0
North Carolina State University – Raleigh	20	75	1000	7.5	57	12	6
North Dakota State University	199	5	277	1.8	1	1	3
Northeastern State University	262	1	3	33.3	0	0	1
Northeastern University	118	13	238	5.5	10	3	0
Northern Arizona University	98	18	131	13.7	1	5	12
Northern Illinois University	239	2	62	3.2	1	1	0
Northwestern University	91	20	317	6.3	12	8	0
Norwich University	262	1	24	4.2	0	1	0
Oakland University	199	5	169	3.0	4	1	0
Ohio Northern University	286	0	79	0.0	0	0	0
Ohio State University	70	28	697	4.0	21	6	1
Ohio University	145	10	211	4.7	9	1	0
Oklahoma Christian University	286	0	18	0.0	0	0	0
Oklahoma State University	98	18	292	6.2	6	4	8
Old Dominion University	123	12	175	6.9	6	5	1
Oral Roberts University	286	0	9	0.0	0	0	0
Oregon State University	286	0	345	0.0	0	0	0
Pacific Lutheran University	286	0	11	0.0	0	0	0
Parks College – St Louis University	239	2	49	4.1	2	0	0
Pennsylvania State University	64	30	1157	2.6	9	21	0
Philadelphia College of Textiles	286	0	6	0.0	0	0	0
Polytechnic University	33	49	267	18.4	28	21	0
Portland State University	188	6	162	3.7	5	0	1
Prairie View A&M University+	3	165	185	89.2	163	2	0
Princeton University	77	24	185	13.0	17	5	2
Purdue University – Calumet	211	4	33	12.1	2	2	0
Purdue University	13	96	1273	7.5	45	45	6
Rensselaer Polytechnic Institute	28	57	583	9.8	26	29	2
Rice University	106	15	172	8.7	2	13	0
Rochester Institute of Technology	145	10	241	4.1	8	2	0
Roger Williams University	286	0	15	0.0	0	0	0
Rose – Hulman Institute of Technology	211	4	225	1.8	2	2	0
Rutgers University	66	29	417	7.0	15	14	0
Saginaw Valley State University	239	2	41	4.9	2	0	0
San Diego State University	44	40	216	18.5	6	33	1
San Francisco State University	134	11	77	14.3	4	7	0
San Jose State University	34	48	448	10.7	13	34	1
Santa Clara University	83	22	57	38.6	4	18	0
South Dakota School of Mines & Technology	239	2	189	1.1	0	0	2
South Dakota State University	262	1	148	0.7	0	1	0
Seattle Pacific University	286	0	15	0.0	0	0	0
Seattle University	199	5	78	6.4	2	3	0
Southern Illinois University – Carbondale	175	7	153	4.6	4	3	0
Southern Illinois University – Edwardsville	106	15	149	10.1	14	1	0
Southern Methodist University	106	15	85	17.6	4	11	0
Southern University+	15	92	98	93.9	92	0	0
St Ambrose University	286	0	4	0.0	0	0	0
St Cloud State University	286	0	33	0.0	0	0	0
St Martins College	220	3	24	12.5	2	1	0
St Marys University++	163	8	14	57.1	0	8	0
Stanford University	25	63	298	21.1	24	35	4
Stevens Institute of Technology	71	27	173	15.6	14	12	1
SUNY – Binghamton Campus	188	6	68	8.8	4	2	0
SUNY – Buffalo Campus	83	22	379	5.8	15	6	1
SUNY – Stony Brook Campus	87	21	118	17.8	10	11	0
SUNY – College at New Paltz	239	2	21	9.5	1	0	1
SUNY – College of Environmental Science	239	2	59	3.4	0	2	0
SUNY – Maritime College	286	0	58	0.0	0	0	0
Swarthmore College	220	3	32	9.4	0	2	1
Syracuse University	145	10	150	6.7	7	3	0
Temple University	145	10	50	20.0	6	4	0
Tennessee State University+	53	37	57	64.9	37	0	0

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Table X, Appendix B

Production of Minority Engineering Graduates, All Institutions, 1996-97

Continued

Institution	Rank	Total Minority (N)	Total Graduates (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)
Tennessee Technical University	134	11	289	3.8	11	0	0
Texas A&M University – Galveston	286	0	19	0.0	0	0	0
Texas A&M University	6	118	1118	10.6	27	90	1
Texas A&M University – Kingsville++	25	63	113	55.8	0	63	0
Texas Technical University	59	33	253	13.0	4	28	1
Trinity College	262	1	10	10.0	1	0	0
Trinity University*	286	0	0	0.0	0	0	0
Tri – State University	286	0	116	0.0	0	0	0
Tufts University	199	5	158	3.2	5	0	0
Tulane University	114	14	158	8.9	8	5	1
Tuskegee University+	5	131	135	97.0	130	1	0
U Akron	163	8	202	4.0	6	2	0
U Akron – Polymer Science	286	0	0	0.0	0	0	0
U Alabama	72	26	211	12.3	22	3	1
U Alabama – Birmingham	134	11	85	12.9	11	0	0
U Alabama – Huntsville	123	12	169	7.1	10	1	1
U Alaska – Anchorage	188	6	32	18.8	0	2	4
U Alaska – Fairbanks	156	9	77	11.7	0	5	4
U Arizona	34	48	441	10.9	2	41	5
U Arkansas	134	11	259	4.2	9	0	2
U Bridgeport	286	0	6	0.0	0	0	0
U California – Berkeley	32	50	841	5.9	12	37	1
U California – Davis	50	38	439	8.7	7	28	3
U California – Irvine	74	25	205	12.2	3	20	2
U California – Los Angeles	44	40	445	9.0	4	35	1
U California – Riverside	199	5	45	11.1	1	4	0
U California – San Diego	46	39	417	9.4	7	30	2
U California – Santa Barbara	123	12	190	6.3	2	10	0
U California – Santa Cruz	188	6	53	11.3	2	3	1
U Central Florida	36	47	332	14.2	9	36	2
U Cincinnati	175	7	311	2.3	6	1	0
U Colorado – Boulder	91	20	436	4.6	2	17	1
U Colorado – Colorado Springs	199	5	57	8.8	1	4	0
U Colorado – Denver	105	16	163	9.8	3	13	0
U Connecticut	118	13	168	7.7	4	9	0
U Dayton	163	8	132	6.1	6	2	0
U Delaware	134	11	131	8.4	10	1	0
U Denver	262	1	15	6.7	1	0	0
U Detroit Mercy	114	14	55	25.5	11	3	0
U District of Columbia+	63	31	49	63.3	28	3	0
U Evansville	286	0	66	0.0	0	0	0
U Florida	14	93	713	13.0	27	64	2
U Georgia	239	2	26	7.7	1	0	1
U Hartford	156	9	76	11.8	9	0	0
U Hawaii	262	1	148	0.7	0	1	0
U Houston	43	41	242	16.9	6	34	1
U Idaho	175	7	212	3.3	1	5	1
U Illinois – Chicago	46	39	314	12.4	19	20	0
U Illinois – Urbana Champaign	23	70	1163	6.0	28	41	1
U Iowa	188	6	219	2.7	4	1	1
U Kansas	156	9	267	3.4	3	4	2
U Kentucky	134	11	392	2.8	8	3	0
U Louisville	175	7	194	3.6	4	2	1
U Lowell	239	2	174	1.1	2	0	0
U Maine – Orono	286	0	154	0.0	0	0	0
U Maryland Baltimore County	72	26	175	14.9	21	2	3
U Maryland – College Park	31	54	535	10.1	38	15	1
U Massachusetts – Amherst	77	24	230	10.4	9	15	0
U Massachusetts – Dartmouth	175	7	71	9.9	3	4	0
U Memphis	156	9	78	11.5	8	1	0
U Miami	83	22	113	19.5	4	18	0
U Michigan – Ann Arbor	16	91	964	9.4	52	37	2
U Michigan – Dearborn	163	8	191	4.2	5	2	1
U Minnesota	106	15	573	2.6	9	5	1
U Minnesota – Duluth	262	1	93	1.1	1	0	0
U Mississippi	134	11	57	19.3	11	0	0
U Missouri – Columbia & Kansas City	123	12	358	3.4	10	2	0
U Missouri – Rolla	64	30	660	4.5	21	6	3
U Nebraska – Lincoln	211	4	280	1.4	1	3	0
U Nevada – Las Vegas	123	12	92	13.0	4	8	0
U Nevada – Reno	188	6	121	5.0	1	3	2
U Nevada – School of Mines	286	0	27	0.0	0	0	0
U New Hampshire	239	2	122	1.6	0	2	0
U New Haven	199	5	80	6.3	2	3	0
U New Mexico++	29	56	191	29.3	2	48	6
U New Orleans	145	10	105	9.5	6	3	1
U North Carolina – Chapel Hill*	286	0	0	0.0	0	0	0
U North Carolina – Charlotte	123	12	144	8.3	9	2	1
U North Dakota	286	0	110	0.0	0	0	0
U North Florida	239	2	17	11.8	0	1	1
U Notre Dame	95	19	236	8.1	5	13	1
U Oklahoma	37	46	445	10.3	23	10	13
U Pacific	156	9	72	12.5	0	9	0
U Pennsylvania	145	10	286	3.5	5	5	0
U Pittsburgh	98	18	290	6.2	15	3	0
U Portland	220	3	57	5.3	0	2	1
U Rhode Island	220	3	127	2.4	3	0	0
U Rochester	163	8	117	6.8	7	1	0
U San Diego	239	2	7	28.6	0	2	0
U Scranton	286	0	13	0.0	0	0	0
U South Alabama	175	7	104	6.7	6	1	0
U South Carolina	60	32	195	16.4	31	1	0
U South Florida	27	58	363	16.0	24	34	0
U Southern California	29	56	334	16.8	19	37	0
U Southern Colorado	220	3	7	42.9	0	3	0
U Southern Maine	262	1	12	8.3	0	1	0
U Southwestern Louisiana	175	7	105	6.7	7	0	0
U St Thomas*	286	0	0	0.0	0	0	0
U Tennessee – Chattanooga	286	0	123	0.0	0	0	0
U Tennessee – Knoxville	81	23	339	6.8	23	0	0
U Texas – Arlington	98	18	253	7.1	6	12	0

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Institution	Rank	Total Minority (N)	Total Graduates (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)
U Texas – Austin	6	118	806	14.6	28	88	2
U Texas – Dallas	134	11	153	7.2	5	5	1
U Texas – El Paso++	10	106	178	59.6	0	105	1
U Texas – Pan American++	38	45	54	83.3	0	44	1
U Texas – San Antonio++	50	38	115	33.0	5	33	0
U Toledo	163	8	221	3.6	3	3	2
U Tulsa	145	10	132	7.6	1	5	4
U Utah	211	4	264	1.5	0	4	0
U Vermont	262	1	99	1.0	1	0	0
U Virginia	54	35	331	10.6	29	6	0
U Washington	41	43	676	6.4	18	17	8
U West Florida	286	0	6	0.0	0	0	0
U Wisconsin – Madison	163	8	615	1.3	4	3	1
U Wisconsin – Milwaukee	134	11	165	6.7	4	6	1
U Wisconsin – Platteville	286	0	186	0.0	0	0	0
U Wyoming	188	6	178	3.4	0	5	1
Union College	239	2	62	3.2	1	1	0
US Air Force Academy	91	20	249	8.0	7	9	4
US Coast Guard Academy	211	4	46	8.7	3	1	0
US Merchant Marine Academy	220	3	115	2.6	1	2	0
US Military Academy	57	34	318	10.7	23	10	1
US Naval Academy	66	29	370	7.8	12	13	4
Utah State University	262	1	181	0.6	0	1	0
Valparaiso University	262	1	68	1.5	0	1	0
Vanderbilt University	98	18	254	7.1	11	5	2
Villanova University	188	6	161	3.7	4	2	0
Virginia Military Institute	239	2	62	3.2	2	0	0
Virginia Polytechnic Institute	50	38	819	4.6	21	16	1
Walla Walla College	239	2	58	3.4	1	1	0
Washington State University	81	23	440	5.2	2	17	4
Washington University	199	5	199	2.5	4	1	0
Washington & Lee University	286	0	4	0.0	0	0	0
Wayne State University	98	18	157	11.5	16	0	2
Webb Institute	286	0	16	0.0	0	0	0
West Coast University	211	4	16	25.0	2	2	0
West Virginia Institute of Technology	220	3	119	2.5	2	0	1
West Virginia University	145	10	234	4.3	5	5	0
Western Michigan University	156	9	222	4.1	6	3	0
Western New England College	286	0	47	0.0	0	0	0
Wichita State University	239	2	158	1.3	1	1	0
Widener University	163	8	71	11.3	4	1	3
Wilkes University	262	1	54	1.9	1	0	0
Winona State University	286	0	18	0.0	0	0	0
Worcester Polytechnic Institute	123	12	413	2.9	6	6	0
Wright State University	175	7	135	5.2	6	1	0
Yale University	114	14	86	16.3	10	3	1
Youngstown State University	211	4	95	4.2	0	4	0
National		**6,422**	**64,032**	**10.0**	**3,203**	**2,954**	**265**

*Institution did not report 1997 graduation data
+HBCU
++HACU

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